

WHAT IS CLAIMED IS:

1. A copy controlling system in a device for receiving and recording compressed and encoded digital contents, comprising:

a means for changing orthogonal transform coefficients for every block obtained by decoding processing of the digital contents, depending on attribute information relative to copying restriction of the digital contents; and

a means for creating stream data for recording after encoding again the orthogonal transform coefficients for every block.

2. A copy controlling system in a device for recording digital contents compressed and delivered by the MPEG (Moving Picture Coding Experts Group) standard, comprising:

a means for requiring even a discrete cosine transform (referred to as "DCT") coefficient of the digital contents, in decoding the digital contents;

a within-block coefficient controlling means for changing the DCT coefficients within a block, according to attribute information relative to recording restriction of the digital contents; and

a means for creating stream data for recording after encoding again the obtained DCT coefficients.

0977467-02603

3. A copy controlling system as set forth in Claim 2,
in which

the attribute information of the digital contents
includes at least one of the following information:

5 recording is prohibited (NeverCopy); since it was
recorded once , no more recording is permitted
(NoMoreCopy); only one recording is permitted
(CopyOnce); and recording is free (CopyFree), and

10 said within-block coefficient controlling means
turns to all 0, the values of the DCT coefficients
within one block other than a DC (direct current)
component and a few AC (Alternating Current) components
of a low frequency region, based on the attribute
15 information, as for the digital contents of the
NeverCopy or the NoMoreCopy.

4. A copy controlling system as set forth in Claim 2,
in which

in the case of the digital contents whose
attribute information is the CopyOnce, information for
5 changing the above to the attribute NoMoreCopy is added
to the DCT coefficients.

5. A copy controlling system as set forth in Claim 2,
in which

in said within-block coefficient controlling

09777467.020601

means, in the case of the digital contents whose
5 attribute information is the NeverCopy or the NoMoreCopy,
the number of the AC components whose values remain in
the DCT coefficients within one block is increased or
decreased periodically with time.

6. A copy controlling system as set forth in Claim 2,
in which

in said within-block coefficient controlling
means, in the case of the digital contents whose
5 attribute information is the NeverCopy or the NoMoreCopy,
the number of the AC coefficients whose values remain in
the DCT coefficients within one block is varied, based
on the compression ratio of the digital contents; and in
the case of the digital contents having a high
10 compression ratio, the number of the AC coefficients
whose values remain is set small, while in the case of
the digital contents having a low compression ratio, the
number of the AC coefficients whose values remain is set
large.

15 7. A recording data controlling system for receiving
a stream selected by a selector, of the MPEG (Moving
Picture Coding Experts Group) stream delivered through a
broadcast or a network and the reproduced MPEG stream
5 from a reproducing device, comprising:

a demultiplexer for separating the received MPEG

stream into video data and data other than the video data;

10 a variable-length code decoder for decoding the video data separated by said demultiplexer into even discrete cosine transform (referred to as "DCT") coefficients and classifying the above into run-length and level of the MPEG standard;

15 a within-block coefficient controlling unit for turning to 0 the values of the DCT coefficients within a block other than a DC component and a predetermined number of AC components of low frequency region;

20 a variable-length code coder for converting the coefficients from the within-block coefficient controller into variable-length codes;

a barrel shifter for combining together code data of variable-length from said variable-length code coder and creating the MPEG video stream;

25 a FIFO memory for temporarily storing data other than the video data separated by said demultiplexer; and

a multiplexer for multiplexing the video data from said barrel shifter and the data other than the video data from said FIFO memory so to supply the MPEG stream for recording.

30 8. A recording data controlling system as set forth in Claim 7, in which

the attribute information relative to recording

restriction of the received MPEG stream is at least one
5 of the following cases: recording is prohibited
(NeverCopy); since it was recorded once, no more
recording is permitted (NoMoreCopy); only one recording
is permitted (CopyOnce); and recording is free
(CopyFree),

10 the attribute information of the MPEG stream is
supplied via another path different from that of the
received MPEG stream, and

when the attribute information of the MPEG stream
is the NeverCopy or the NoMoreCopy, the attribute
15 information is supplied to said within-block coefficient
controlling unit, where the values of all the
coefficients within one block other than a DC component
and a AC component adjacent to the DC component are
turned to all 0.

20 9. A recoding data controlling system as set forth
in Claim 7, in which

said within-block coefficient controlling unit
further including

5 a latch circuit which is cleared every time a
block start signal indicating the initial value within
one block becomes active and preserves the output of an
adder every time the AC component within one block is
supplied;

10 an adder for adding the output of said latch

circuit and run-length supplied from said variable-length code decoder,

the addition result of said adder indicating the number of the coefficient at a time of zigzag scanning the DCT coefficients within a block;

a comparator for comparing the output of said adder with the position of the AC coefficient whose value remains which is predetermined; and

a mask circuit for performing mask processing on the received DCT coefficients, based on the output from said comparator, and supplying the processed DCT coefficients.

10. A copy controlling method of digital contents, comprising the steps of:

a step of receiving compressed and encoded digital contents, requiring orthogonal transform coefficients for every block of the digital contents in decoding the digital contents, and changing the orthogonal transform coefficients, depending on attribute information relative to copying restriction of the digital contents; and

a step of creating stream data for recording after encoding again the obtained orthogonal transform coefficients.

11. A copy controlling method of digital contents in

09777467-020501

a system for recording the digital contents compressed and delivered by the MPEG (Moving Picture Coding Experts Group) standard, comprising the steps of:

5 a step of requiring even a discrete cosine transform (referred to as "DCT") coefficient of the digital contents, in decoding the digital contents, and changing the DCT coefficients within a block, according to attribute information relative to recording
10 restriction of the digital contents; and

 a step of creating stream data for recording after encoding again the obtained DCT coefficients.

12. A copy controlling method as set forth in Claim 11, in which

 the attribute information of the digital contents includes at least one of the following information:
5 recording is prohibited (NeverCopy); since it was recorded once, no more recording is permitted (NoMoreCopy); only one recording is permitted (CopyOnce); and recording is free (CopyFree), and

 as for the digital contents whose attribute
10 information is the NeverCopy or the NoMoreCopy, the values of the DCT coefficients within one block other than a DC (direct current) component and a few AC (Alternating Current) components of a low frequency region are turned to all 0.

13. A copy controlling method as set forth in Claim 11, in which

in the case of the digital contents whose attribute information is the CopyOnce, information for changing the above to the attribute NoMoreCopy is added to the DCT coefficients.

14. A copy controlling method as set forth in Claim 11, in which

in the case of the digital contents whose attribute information is the NeverCopy or the NoMoreCopy, the number of the AC components whose values remain, in the DCT coefficients within one block, is increased or decreased periodically with time, not turned to 0.

15. A copy controlling method as set forth in Claim 11, in which

in the case of the digital contents whose attribute information is the NeverCopy or the NoMoreCopy, the number of the AC coefficients whose values remain, in the DCT coefficients within one block, is varied, based on the compression ratio of the digital contents; and in the case of the digital contents having a high compression ratio, the number of the AC coefficients whose values remain is set small, while in the case of the digital contents having a low compression ratio, the number of the AC coefficients whose values remain is set

large.

16. A computer readable memory for storing a copy
controlling program for executing a copy control of
digital contents while controlling a computer,

the copy controlling program including:

5 a step of receiving compressed and encoded
digital contents, requiring orthogonal transform
coefficients for every block of the digital contents, in
decoding the digital contents, and changing the
orthogonal transform coefficients, depending on
10 attribute information relative to copying restriction of
the digital contents; and

a step of creating stream data for recording
after encoding again the obtained orthogonal transform
coefficients.

15 17. A computer readable memory for storing a copy
controlling program for executing a copy control of
digital contents while controlling a computer in a
system for recording the digital contents compressed and
5 delivered by the MPEG (Moving Picture Coding Experts
Group) standard,

the copy controlling program including:

a step of requiring even a discrete cosine
transform (referred to as "DCT") coefficient of the
10 digital contents in decoding the digital contents, and

09777467.026501

changing the DCT coefficients, according to attribute information relative to recording restriction of the digital contents; and

15 a step of creating stream data for recording after encoding again the obtained DCT coefficients.

18. A computer readable memory for storing a copy controlling program as set forth in Claim 17, in which

the attribute information of the digital contents includes at least one of the following information:

5 recording is prohibited (NeverCopy); since it was recorded once, no more recording is permitted (NoMoreCopy); only one recording is permitted (CopyOnce); and recording is free (CopyFree), and

10 as for the digital contents whose attribute information is the NeverCopy or the NoMoreCopy, the values of the DCT coefficients within one block other than a DC (direct current) component and a few AC (Alternating Current) components of a low frequency region are turned to all 0.

15 19. A computer readable memory for storing a copy controlling program as set forth in Claim 17, in which

in the case of the digital contents whose attribute information is the CopyOnce, information for changing the above to the attribute NoMoreCopy is added to the DCT coefficients.

09777467-026601

20. A computer readable memory for storing a copy
controlling program as set forth in Claim17, in which
in the case of the digital contents whose
attribute information is the NeverCopy or the NoMoreCopy,
5 the number of the AC components whose values remain, in
the DCT coefficients within one block, is increased or
decreased periodically with time, not turned to 0.

21. A computer readable memory for storing a copy
controlling program as set forth in Claim17, in which
in the case of the digital contents whose
attribute information is the NeverCopy or the NoMoreCopy,
5 the number of the AC coefficients whose values remain,
in the DCT coefficients within one block, is varied,
based on the compression ratio of the digital contents;
and in the case of the digital contents having a high
compression ratio, the number of the AC coefficients
10 whose values remain is set small, while in the case of
the digital contents having a low compression ratio, the
number of the AC coefficients whose values remain is set
large.

09777467-026601